UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 26 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Review of the Technical Impracticability of Ground-Water Remediation Report, Crystal Chemical Superfund Site

FROM: Cal Williames and Peter Feldman
Office of Emergency and Remedial Response

TO: Lisa Price
Remedial Project Manager
U.S. EPA Region 6

We have reviewed the document entitled "Assessment of the Technical Impracticability of Ground-Water Remediation, Crystal Chemical Superfund Site, Houston, Texas," dated August 1995. The report has been submitted to EPA in support of a technical impracticability (TI) ARAR evaluation for a part of the ground water arsenic contamination in the 15-foot and the 35-foot zones at the site. We have also read ORD's comments, prepared by Scott Huling of the R.S. Kerr Laboratory (October 2, 1995), concerning this document

COMMENTS

1. The TI evaluation adequately addresses the components recommended in the *Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration* (EPA Publication 9234.2-25). Moreover, the site conceptual model is well presented and documented. The history of arsenic contamination at and adjacent to the site is well delineated. Based on maps and other subsurface information, the proposed TI zone is satisfactorily defined.

2. A ground-water pump and treat remedy was mandated by a 1990 Record of Decision. The remedial action performance analysis presented in the TI evaluation for the Crystal Chemical site is based on extensive hydrologic modelling, and site-specific geochemical data and stratigraphic information. Based on these analyses, it is probable that much of the arsenic has diffused into clays and silts, mechanically dispersed into small dead end pores and/or adsorbed onto aquifer solids. Thus, the mandated pump and treat remedy would likely require an unreasonably long timeframe (perhaps several hundred years) to achieve the required

cleanup levels throughout the contaminated aquifers. Therefore, we concur with the TI evaluation's conclusion that the pump and treat remedy is technically impracticable for much of the site.

3. The TI evaluation proposes that the best alternative remedial strategy for contaminated ground water at the site is containment by construction of a slurry wall combined with limited pump and treat (p. 102). The slurry wall would encompass virtually all of the proposed TI zone from the surface to the base of the 35-foot zone (see Figure 59). The very southeastern part of the contaminated area in the 35-foot zone would not be part of the proposed TI zone and would be remediated by a pump and treat approach (see Figures 59 and 60).

Based on the information presented, containment by means of a slurry wall appears to be a reasonable alternative to the pump and treat remedy selected in the 1990 Record of Decision. ORD's concerns, regarding the long-term reliability of a slurry wall in contact with arsenic-rich aqueous solutions, can be addressed by a well designed and implemented ground-water monitoring program at the site. Special care should be taken to monitor the 15-foot, 35-foot and 100-foot zones, as outlined in the TI evaluation, to detect any unanticipated vertical migration from the contaminated source area (p.109-110).

4. The slurry wall does not enclose two small areas with low arsenic exceedences in the 15-foot zone (east and west extremes of the proposed TI zone in this water-bearing unit; p. 103; Figures 3 and 59). As we understand from our telephone conservation of October 5, 1995, these areas are not included because of low arsenic concentration and mass, natural containment within a channel by low permeability material and the technical impracticability of construction and remediation below the flood-control channel. We recommend this issue be further explained in the text based on existing data.

5. Elevated ground-water arsenic concentrations are recorded for samples from well WSW-1 (see Table 5). This well is screened in the 300-foot water-bearing unit beneath the proposed TI zone. Based on our telephone conversation of October 5, 1995, you indicate these data are spurious and are likely a result of contamination introduced to the zone through poor drilling and well construction practices. It is important that this point be addressed by supplying information demonstrating the lack of arsenic contamination in the 300-foot zone. The possible source of the anomalous arsenic concentrations should also be explained.

6. ORD's October 2, 1995 memorandum contains several additional comments and issues regarding the TI evaluation. Pending resolution of these remaining issues, we see no problem with proceeding with the alternative slurry wall remedy for the Crystal Chemical site.

We hope these comments are helpful. If you require further explanation or assistance, please call Cal James at (703) 603-9038 or Peter Feldman at (703) 603-8768.

cc: Betsy Shaw
Bruce Means